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22. MISTAKEN IDENTIFICATION AND DISTRIBUTION RANGE OF *COMMELINA CAROLINIANA* WALTER (COMMELINACEAE) – AN ADDITION TO THE LIST OF *COMMELINA* SPECIES OF JAMMU AND KASHMIR, INDIA

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A few plants of a *Commelina* species collected from three localities of Jammu [along the banks of a freshwater canal, outside the new campus (University of Jammu), and agricultural fields of Ranbir Singh Pura and Bishnah tehsils] were transplanted in the experimental plots of the Botanical Garden, University of Jammu. While identifying the species through published floras and other literature (Hooker 1892; Prasad *et al.* 1996; Sharma and Kachroo 1981; Swami and Gupta 1998), we realised that the species, initially mistaken for *Commelina paludosa* Blume, was *Commelina caroliniana*

Table 1: Morphological characterisation of the collection of *Commelina caroliniana*

Character	Present collection	Hooker (1892)	Faden (1993)
Flowering	July/Aug. to Nov.	Not mentioned	July to Nov.
Spathe type	Peduncled, leaf opposed, ovate-cordate, not falcate	Peduncled, axillary, cordate	Not at all to slightly falcate
Upper cyme	Well-developed in spathes of older age, usually 1-flowered	Not mentioned except 1-2-fid	Usually vestigial, rarely well-developed and 1-flowered
Staminodes	Three, each 6-lobed, yellow usually with a central maroon spot	Not mentioned	Three, all with well-developed antherodes, yellow, usually with a central maroon spot
Middle anther	Connective white	Not mentioned	Connective white
Leaf length (cm)	3.6–18.9	2.6–7.2	2.5–10.5
Leaf breadth (cm)	1.2–2.9	1.3–1.8	0.7–2.4
Spathe length (cm)	1.8–3.0	1.3–2.6	2.35; Walter's record
Spathe breadth (cm)	0.7–1.2	Not mentioned	0.8
Fruit length (mm)	7–9.5	Not mentioned	(5-)6–8
Seed*			
i. Length (mm)	3.8–5.5	Not mentioned	2.4–4.3(-4.6)
ii. Breadth (mm)	1.8–3.0	Not mentioned	(1.6-)2.0–2.3
Chromosome number	2n=90	Not mentioned	2n = *c*.86

*Posticous (Ventral locule)

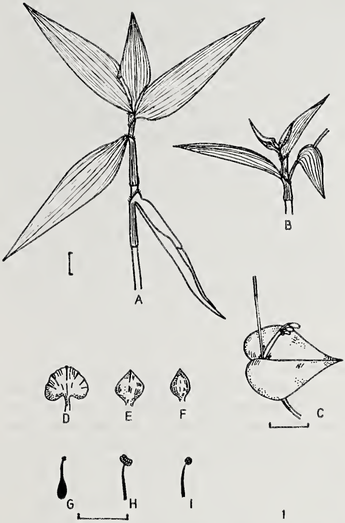

Fig. 1: *Commelina caroliniana* Walter: A. Branch; B. Spathe; C. Spathes with margins drawn apart showing the lower cyme; D. Petal; E. Anterior petal; F. Sepal; G. Pistil; H. central stamen; I. Lateral stamen. Scale bars: a–b = 1 cm, c =1.8 cm, d–i = 2.3 cm.

Walter (synonym *C. hasskarlii* Clarke). The identity of the species was further confirmed by Dr. Robert Faden of the Smithsonian Institution, USA. Voucher specimens were deposited at the Smithsonian Institution, and Botanical Survey of India, Kolkata, India.

C. caroliniana had not been recorded earlier from Jammu and Kashmir (Dhar and Kachroo 1983; Kachroo *et al.* 1977; Kapur and Sarin 1990; Kaul 1986; Murti 2001; Sharma and Kachroo 1981; Singh *et al* 2002; Swami and Gupta 1998), and hence, this was the first report for the state (Kaul and Koul 2007). With this, the number of species of the genus *Commelina* in Jammu division increased to four; the others being *C. benghalensis* L., *C. kurzii* Clarke and *C. paludosa* Blume (Sharma and Kachroo 1981; Swami and Gupta 1998). Till this record, *C. caroliniana* was reported from the upper Gangetic plains; Kumaon and from Delhi eastwards to Assam and Bengal, and, southwards to the Deccan peninsula (Hooker 1892). With the recent report of its occurrence in Jammu (Kaul and Koul 2007), the northern limit of its distribution range has extended to the Shiwaliks.

***Commelina caroliniana* Walter**

C. caroliniana grows in varying habitats such as fields, roadsides, yards, and other such places wherever moisture is available. It frequently grows as a weed in rice, maize, and sugarcane fields (Faden 1993; Kaul 1998). Morphological details of the plants (Fig. 1) collected by us are summarised below.

Stem much branched, 68–169 cm long, scandent or decumbent. Roots arise at nodes also, particularly at the lower ones. Leaves 3.6–18.9 x 2–2.9 cm, large, dark green, glabrous or puberulous, narrowly lanceolate, alternately arranged with sheathing bases and entire margins, apex acute to acuminate, 3–9 times longer than broad. Inflorescence a cincinnus borne within solitary leaf opposed spathes 1.8–3.0 cm long and 0.7–1.2 cm broad, margins free to the base, not at all to slightly falcate, lacking contrasting veins, bright green, puberulous, peduncles 1.1–2.5 cm, ovate–cordate and longer than broad. Flowers borne in two separate cymes; upper cyme single (male) flowered, exserted; lower 3–4, (-5) flowered, hermaphrodite. Flowers trimerous, zygomorphic and chasmogamous. Sepals 0.4–0.5 x 0.2–0.4 cm, membranous, transparent and ovate, the two anterior ones larger than the posterior one. Petals 0.5–1.1 x 0.4–0.9 cm, all blue to bluish-violet and clawed; anterior petal small 0.74 x 0.61 mm, ovate-obovate, and pointed at the tip. Androecium-3 large fertile and 3 small vestigial stamens. Anthers dimorphic; the central one 1.6–1.97 x 0.95–1.2 mm, long, curved, bright yellow and versatile; two lateral 1.0–1.3 x 0.87–1.06 mm, straight, yellow and basifixed, filaments 6.0–11 mm long, curved. Anthers of staminodes bright yellow, usually with a central maroon spot, 6-lobed, variable in size and shape, borne on 4–7 mm slender filaments. Gynoecium 7.5–9.5 mm long, tricarpellary syncarpous; ovary trilocular, light green to greenish-white bearing trichomes on its surface, mucilaginous; style long, light to whitish-green terminating into a 3-fid violet stigma; ovary 5-ovulate; two in each anticous (dorsal) and one, which is the largest, in posticous (ventral) locule. Fruits glabrous, green, trilocular 7–9.5 x 3–4.5 mm when dry, slightly pointed at distal end. Dehiscence loculicidal; two anticous chambers emptied simultaneously; posticous locule indehiscent. Seeds 5, 2 in each anticous and 1 in posticous chamber, smooth to faintly alveolate, cylindric-conic mealy. Chromosome number 2n=90; meiosis I & II normal.

Fl. and Fr.: Last week of July or first week of August to November.

All the features elaborated above, together identify the study material with *Commelina caroliniana*. The chromosome number of the plants (Kaul 1998; Kaul and Koul 2007, 2008; Kaul *et al.* 2007) also agrees with that reported by Raghavan and Rao (1961), and Kammathy and Rao (1961a, b) for *C. hasskarlii* Clarke (Fedorov 1969), which is a synonym of *C. caroliniana*.

The morphological details of *C. caroliniana* recorded by us were compared with those given by Hooker (1892), and Faden (1993) – see Table 1. As is evident from Table 1, there are many distinct differences in some quantitative as well as qualitative traits. Despite these differences, the plants collected and described here conform to the description of *C. caroliniana.* The presence of significant differences in the majority of the quantitative features, probably due to geographical factors, is suggestive of the Jammu collection as being an addition to the existing germplasm of *C. caroliniana*.

Commelina caroliniana, native to India and Bangladesh, is an introduced species in United States where it was first described by Thomas Walter in 1788 in Flora Caroliniana (Faden 1989). The species was, however, treated differently by different workers: it was treated as a synonym of *C. communis* by some (Vahl 1805–1806), *C. diffusa* by C.B. Clarke in 1881 and Duncan and Kartez in 1981; a distinct species by Muhlenberg in 1818 and doubtful by A. Radford in 1968 (Faden 1989 and references therein). Robert Faden's detailed research on Walter's original description and specimens established the species to be different from *C. diffusa*. Later, he noticed that *C. caroliniana* was identical to a species found in India, namely *Commelina hasskarlii* described and named by Charles Baron Clarke in 1874 nearly a century after Walter's work. According to Faden, *C. caroliniana* must have been introduced to the United States because it was closely related to several Old World species of *Commelina* more than any North American species. Subsequently, he proposed that *Commelina hasskarlii* Clarke is a synonym of *C. caroliniana* (Faden 1989, 1993, 2000). In India, the species is still being erroneously referred to as *C. hasskarlii* (Karthikeyan *et al.* 1989; Prasad *et al.* 1996) despite Faden's (1989, 1993) repeated elaborations on the matter. Lack of updating the available literature by the authorised agencies can lead to serious implications in research.

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